



ABSTRACT

A two-stage cryocooler (10) includes an ambient temperature portion (12), a first-stage temperature portion (14), and a second-stage temperature portion (16). The ambient temperature portion includes a surge volume (44) that is coupled to and in communication with the first-stage temperature portion. The surge volume may be coupled to a first-stage interface (36) of the first-stage temperature portion by use of an inertance tube (42). Locating the surge volume in the ambient temperature portion may advantageously reduce size and mass of the first-stage temperature portion. Also, thermal losses may be reduced by maintaining the surge volume at ambient temperature. Space and structural requirements for maintaining the system may be met more easily with the surge volume maintained in the ambient temperature portion of the two-stage cooler. The surge volume may be a separate unit, or may be a plenum or other chamber within an expander in the ambient temperature portion.